AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraphs beginning at page 1, line 9, and continuing to page 1, line 14, as follows:

The invention refers to ~~a method for~~ enhancing the measuring accuracy in an antenna array comprising a number of antenna elements. ~~The~~ A method comprises the ~~steps~~ acts of;

- receiving analog signals on a number of m antenna array elements, and;

-producing a radiation diagram for the array from the values in the signals.

The ~~invention~~ technology also refers to an antenna array system comprising

Please amend the paragraph beginning at page 2, line 27, and continuing to page 2, line 30, as follows:

It is a desirable feature for an antenna system to have the ability to detect and estimate the direction of arrival of the target with a reasonable probability (reasonably low standard deviation). An optimum is thus sought for the trade ~~of~~ off between low standard deviation and low SNR.

Please amend the paragraph beginning at page 4, line 10, and continuing to page 4, line 14, as follows:

It is an object of the ~~invention~~ technology to diminish random errors regarding the resolving probability of the target when trying to narrow the main lobe, in order to get better estimation of the direction-of-arrival of a target. It is thus an object of the ~~invention~~

technology to eliminate the grating lobe problem when trying to "zoom in" on a target, i.e. to achieve a better measuring accuracy.

Please amend the caption on page 4, line 16 as follows:

~~DISCLOSURE OF INVENTION~~BRIEF SUMMARY

Please amend the paragraphs beginning on page 4, line 17, and continuing to page 4, line 25, as follows:

The ~~invention~~ technology intends to meet the above objectives with a method for enhancing the measuring accuracy in an antenna array comprising a number of antenna elements. ~~,~~

The method comprises the ~~steps~~ actsof~~;~~ :

- receiving analog signals with the antenna array elements, and;
- -producing values for a radiation diagram from the values in the signals, where the radiation diagram displays a main lobe and grating lobes when present.

Please amend the paragraph on page 5, line 9, as follows:

The ~~invention~~ technology is characterised in that the method comprises the ~~steps~~ acts of;

Please amend the paragraph beginning on page 5, line 27, and continuing to page 6, line 2, as follows:

The first part of ~~step~~ act a) is to receive analog signals on all antenna elements at a first time t_1. The antenna elements are advantageously placed in the antenna array with

their relative distance equal to or greater than the wavelength divided by two. The wavelength refers to the frequency used in the antenna array system. The relative distance of the antenna elements fulfils the Nyqvist criteria which is which is why there will be no grating lobes appearing in the radiation diagram when using a full array.

Please amend the paragraphs beginning on page 6, line 20, and continuing to page 6, line 27, as follows:

Below the ~~invention~~ technology will be described as finding values in the radiation diagrams. However, the ~~invention~~ technology may instead use the technique of finding the values in the vectors generating the radiation diagrams. The two techniques shall be seen as essentially equivalent to each other.

According to ~~step~~ act b), the antenna elements may be switched off or reduced by using antenna elements that may be manipulated, for example electronically.

Please amend the paragraph beginning on page 9, line 17, and continuing to page 9, line 23, as follows:

~~Step~~ Act b) and ~~step~~ act c) may be repeated in time until the antenna array comprises only the two outermost antenna elements. This antenna configuration generates the narrowest main lobe with the lowest amplitude and the highest grating lobes. Thus, this configuration produces a radiation diagram where it may be difficult to find the maximum point for the main lobe. The grating lobes may actually be as high as the main lobe for some antenna configurations.

Please amend the paragraph beginning on page 10, line 1, and continuing to page 10, line 19, as follows:

The radiation diagrams comprise the values of the gain G(θ) versus the azimuth angle θ. Since the number of antenna elements at the second time t_2 is less than the maximum number of antenna elements, grating lobes will appear in the second radiation diagram. Consequently, since the antenna configuration at a third time t_3 has even lesser antenna elements, more grating lobes will appear in a third radiation diagram. In the second and third radiation diagram the grating lobes appear at different angles dependent on which and how many antenna elements that has been switched of or reduced. In the second radiation diagram the first grating lobes appear on each side of the main lobe at certain angles, e.g. $\theta_{t2} = X_{t2}$ radians (or degrees) and $\theta_{t2} = -X_{t2}$ radians (degrees). In the third radiation diagram the first grating lobes appear on each side of the main lobe at certain angles, e.g. $\theta_{t3} = X_{t3}$ radians (or degrees) and $\theta_{t3} = -X_{t3}$ radians (degrees). According to the ~~invention~~technology, X_{t2} is greater than X_{t3} and $-X_{t2}$ is lesser than X_{t3}, i.e. the first grating lobes in the third radiation diagram appear closer to the main lobe than the first grating lobes in the second radiation diagram. The third radiation diagram presents a second range outside which the grating lobes will appear. According to the above the second range must be narrower than the first range.

Please amend the paragraphs beginning on page 10, line 29, and continuing to page 11, line 14, as follows:

In another example embodiment~~ of the invention~~, a number of radiation diagrams will be produced for every antenna array configuration. The number of radiation diagrams may be used for calculating a mean value for the antenna array configuration, i.e. a mean value for the gain at different angles. A mean value may be calculated by any known methods e.g. Bartlett. Furthermore, when calculating a number of radiation diagrams for each time, it is possible to reject all radiation diagrams where the maximum is found/calculated outside the range. This increases the measuring accuracy since the desired maximum value for the main lobe may be found in at least one radiation diagram.

The ~~invention~~ technology may thus be used by dynamically altering the antenna array such that interadjacent antenna elements are switched off or reduced until only the outermost antenna elements remain.

The benefits of the ~~invention~~ technology ~~above method~~ will become apparent when describing the example embodiments below.

Please amend the paragraph beginning at page 11, line 25, and continuing to page 11, line 26, as follows:

Fig. 1 shows an antenna array according to one example embodiment ~~of the invention,~~ with a number of t_1-t_4 configurations in time.

Please amend the paragraph beginning at page 12, line 29, and continuing to page 12, line 30, as follows:

Fig 11 diagrammatically shows a block diagram over the method ~~according to the invention~~ according to one example embodiment.

Please amend the caption on page 13, line 1 as follows:

~~MODES FOR CARRYING OUT THE INVENTION~~DETAILED DESCRIPTION

Please amend the paragraph beginning on page 13, line 14, and continuing to page 13, line 31, as follows:

Fig. 1 shows an antenna array 1 according to one example embodiment ~~of the invention~~ comprising five antenna elements 2, with a number of configurations in time.

The antenna elements 2 are depicted with a large X. At the first time t_1 the antenna array 1 uses all of the antenna elements 2. At the second time t_2 the antenna array 1 uses all but one of the antenna elements 2. At the third time t_3 the antenna array 1 uses all but two of the antenna elements 2. At the fourth time t_4 the antenna array 1 uses all but three of the antenna elements 2. As can be seen in fig. 1, the configuration of the antenna array 1 at the fourth time t_4 uses only the two most widely separated antenna elements 2.

~~With~~ "~~not~~ Not using" an antenna element or "removing" one antenna element~~,~~ means that the signals from the antenna array 1 are reduced or blocked. This is advantageously done before the sampling of the signals, but may be carried out after the sampling. However, if the antenna elements 2 are to be reduced or blocked after the sampling, the system should require one sampling device per antenna element. In fig. 1 the reduced antenna elements 2 are depicted with a small x and denoted with 2'.

Please amend the paragraph beginning on page 18, line 25, and continuing to page 19, line 8, as follows:

The grating lobes 7 will appear closer to the main lobe 6 for each time that an antenna element 2 is removed and the main lobe 6 will become narrower. In figs. 6-8 the advantage of the ~~invention~~ technology is apparent, where the rejection of the grating lobes 7 for the different times generate a possibility to gain a narrow main lobe 6 that enables a good measuring accuracy of a target.

Fig. 9 schematically shows a graph depicting the Cramér-Rao Lower Boundary (CRB) and the standard deviation σ versus the Signal to ~~Noice~~ Noise Ratio (SNR). The standard deviation is a deviation of the angle. Figure 9 also shows a first point P_1 at a certain distance from CRB and a second point P_2 at a second location. The first point P_1

has a higher SNR and consequently a lower standard deviation σ than the second point P_2. However, a lower SNR allows more noise in the signal, which is why the antenna array 1 may be used for detecting a target at a further distance (or a smaller target) than with a system at the first point P_1, if the increase in the standard deviation can be accepted.

Please amend the paragraph beginning on page 20, line 1, and continuing to page 20, line 6, as follows:

When reducing the array according to the ~~invention~~ technology the width of the main lobe 6 will decrease, and the threshold will move closer to the CRB with a demand for a higher SNR, than for the previous configuration of the array. This is depicted in fig. 9 where the second point P_2 has moved to the fourth point P_4.

Please amend the paragraph beginning on page 20, line 23, and continuing to page 20, line 30, as follows:

According to the ~~invention~~technology, the rejection of the grating lobes 7 outside the ranges for the different radiation diagrams, removes the jump from the second point P_2 to a third point P_3 as well as the jump from the fifth point P_5 to a sixth point P_6. This is due to the fact that there will be no errors when calculating the maximum point 8 for the main lobe 6 since there are no maximum points from grating lobes 7 that can give rise to an error. In fig 9, this is depicted as moving the third point P_3 to the third point prime P_3' and as moving the sixth point P_6 to the sixth point prime P_6'.

Please amend the paragraph beginning on page 21, line 1, and continuing to page 21, line 7, as follows:

Fig. 10 shows a two-dimensional antenna array 1 system according to one example embodiment ~~of the invention~~, with a number of configurations in time t_1, t_m, t_n. The antenna array 1 system comprises five rows along an Y-axis. Each row comprises ten antenna elements 2 along a Z-axis. The antenna elements 2 are reduced or switched off in the same manner as described in fig. 1. The ~~invention~~ technology described above is thus possible to use on two-dimensional antenna arrays

Please amend the paragraphs beginning on page 21, line 19, and continuing to page 21, line 28, as follows:

The ~~invention~~ technology may be used for a two-dimensional array as depicted in fig. 10. Fig 11 shows that the reduction of the two-dimensional antenna array 1 gives diminished ranges for the grating lobes 7 and a diminished width of the main lobe, as for the one-dimensional antenna array 1 as depicted in fig. 1. The grating lobes 7 may thus be rejected in a two-dimensional antenna array 1 system according to the above method.

Fig 12 shows a block diagram over the method according to ~~the invention according to~~ one example embodiment. The blocks in fig. 12 depict a number of means suitable for performing the method.

Please amend the paragraph beginning on page 22, line 30, and continuing to page 23, line 2, as follows:

The system comprises means 19 for repeating ~~step~~ act b) and ~~step~~ act c) such that the antenna configuration dynamically is altered such that interadjacent antenna elements 2 are switched off or reduced until only the outermost antenna elements 2 remain.